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ABSTRACT

This report summarizes the evaluation of civilian training in six Federal government agencies. A representative sample of executive, managerial, technical, clerical and scientific training programs were selected. The project's purposes were: (1) to produce useful examples of systematic training evaluation; and (2) to generate recommendations for improving training evaluation. The fundamental conclusions were: (1) constructive evaluation of all types of training is achievable; (2) evaluation can reduce costs and significantly improve training results; and (3) training should be linked with other management tools to more effectively solve performance problems. Six problems identified in the training evaluation projects that require attention are discussed. Recommendations for the Office of Management and Budget and the Office of Personnel Management for guiding and encouraging agencies in implementing effective training and evaluation practices are given. The appendix contains executive summaries from the six evaluation demonstration case studies (Department of Agriculture, National Institutes of Health, Government Printing Office, Office of Personnel Management, National Aeronautics and Space Administration, and Fort Belvoir). (BS)

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Report of the

Training Evaluation Demonstration Project

Issues and Recommendations

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March 1979

TM 840 493

United States of America
Office of Personnel Management
Workforce Effectiveness and Development Group
Training Leadership Division

PREFACE

Issues and Recommendations is the introductory section of a seven-part report on the evaluation of civilian training in the Federal government. The remaining six parts are case studies which demonstrate the conduct of evaluation across a broad range of training: Each case study has been written as an example of how evaluators may negotiate, design, develop, and implement training evaluation in an agency setting. Each is also an example of how an evaluation effort may be reported to a decision-maker.

Much effort was expended in each demonstration project to use as comprehensive an evaluation design as possible, given the organizational constraints which confronted each evaluation team. Emphasis was given to the utility of the results. We asked in each case what it was that the client most needed to know about the training being evaluated. We discovered firsthand what program evaluators have discussed in the professional literature on evaluation research: comprehensive evaluation design can be difficult at best to achieve in a normal work setting, and utility can be difficult to define in advance. Yet, we believe our efforts have yielded information that is basically valid and useful to our clients.

We wish publicly to express thanks for the cooperation and assistance provided in each of the six agencies whose course or program was evaluated. Without people who were willing not only to have a portion of their training thoroughly assessed but to collaborate actively in that effort, these demonstrations would not have been feasible.

We anticipate that the cooperation agencies demonstrated during this project along with the results of the evaluations will prompt further efforts to systematically evaluate training in the Federal government. Perhaps more significant than any of the reported findings on training is the confirmation through this experience that comprehensive evaluation can be conducted, and that it can lead to constructive recommendations for change without intimations of failure.

The seven parts which comprise the report are:

Issues and Recommendations

Case Study 1: An Evaluation of the Executive Development Program of the Science and Education Administration, United States Department of Agriculture

Case Study 2: An Evaluation of a Scientific/Technical Course on Radiological Health and Safety Presented by the National Institutes of Health

Case Study 3: An Evaluation of a Technical Course on Electronic Photocomposition Keyboard Techniques Presented at the Government Printing Office

Case Study 4: An Evaluation of an Interagency Course on Training Evaluation Presented by the Office of Personnel Management

Case Study 5: An Evaluation of a Clerical Course on Travel Regulations Presented by the National Aeronautics and Space Administration

Case Study 6: An Evaluation of an Organizational Development and Training Effort in Management Communications Conducted at Fort Belvoir

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INTRODUCTION

In July 1978, following extended discussion with OMB staff, OPM (then CSC) undertook a training evaluation demonstration project which involved the cooperation of six governmental agencies. The specifications for the project were formalized by letter of detail. The essentials of that agreement were that CSC would undertake as representative a sampling as possible of Federal training and would report its conclusions and recommendations regarding the evaluation of Federal training to OMB by March 31, 1979.

The demonstration evaluations have been documented in the case studies of this report. It is our intention to publish these training evaluations for dissemination to Federal agencies and other organizations concerned with accountability in Federal training. We believe these evaluations can assist trainers and managers to develop and conduct their own evaluations of training and other employee development activities.

The Scope and Nature of Federal Training

In fiscal year 1977, 555,544 civilian employees received 37,469,999 hours of training at a reported cost of $256,941,055 (excluding trainees' salaries and certain other costs). Although this training represents an annual multi-million dollar expenditure, the great bulk of it involves many relatively small expenditures and small numbers of employees. Moreover, the manner of funding training, the structure of training organizations and the resources available to those organizations vary widely.

The Evaluation Demonstrations

In the interest of obtaining as representative a sample of Federal training as possible for the demonstration study, OPM selected candidates whose course or program exemplified the following types of training: executive, managerial, technical, clerical and scientific (See Appendix for executive summaries). The following is a descriptive list of the projects:

Agency	Type of Training	Specific Target
Science and Education Administration, USDA	Executive	The Executive Development Program

Fort Belvoir, Dept. of the Army	Management	A managerial communications course for directorate
Government Printing Office	Contracted Technical	A contracted photocomposition course for operators
Office of Personnel Management	Interagency Technical	An interagency course on evaluation of training courses
National Aeronautics and Space Administration	Clerical	A workshop on travel regulations for secretaries who prepare travel orders and vouchers
National Institutes of Health	Technical/Scientific	A course on radiological health for radionuclide users

The project served two basic purposes. One was to produce examples of training evaluation which would be useful to agency trainers and evaluators. Another was to generate recommendations for improving the practice of training evaluation as a means of improving Federal training.

Training Evaluation: An Operational Definition

By the term training evaluation we mean a systematic investigation of the value of a course or a program of training or employee development. We view the purpose of training evaluation as essentially two-fold: to yield judgment regarding how well the course or program met its instructional objectives; and to yield judgment regarding the impact of the course or program on a larger system, e.g., an entire organization.

We use the term systematic to emphasize an essential difference between evaluation and assessment. We understand assessment as meaning the process of measuring the effect of one variable or set of variables on another. Thus one may assess the impact of training on job performance. Evaluation, by way of contrast, would involve drawing inferences from the data which such an assessment might yield and weighing it with other data such as

that generated by investigating the impact of other variables on job performance (to include incentives, disincentives, work-flow and communications).

The evaluation demonstrations completed by OPM then are systematic investigations of the value of an executive development program and several training courses. As such these investigations impel the evaluators to do more than merely collect and display data; they require the evaluators to draw inferences about relative value in terms of costs and benefits to the organization.

It is anticipated that the six evaluation demonstrations will prove useful to agency trainers as examples of how evaluations can be negotiated, planned, conducted and reported in operational environments. However, the demonstrations are not meant to be applied as strict models or paradigms. Each agency's training courses and programs require evaluation designs and methodology which are tailored to meet the unique objectives, constraints and resources within that agency.

Project Costs

The salary cost incurred by OPM's Training Leadership Division in undertaking the project was approximately $137,000. This cost was derived from a careful recording of hours spent by each individual on the project. Other cost not recorded but incurred are those associated with duplication of typed material, use of computer time, travel, start-up time not offically charged to the project, library resource material and time given to the evaluation effort by agency personnel cooperating with the OPM evaluation teams.

Each evaluation demonstration was costed separately (a detailed account of costs is given in an appendix to each volume). The reader should consider these costs as suggestive rather than prescriptive. In some cases, instruments central to the data collection process had already been developed and validated before the evaluation began. Had these instruments been developed as part of the evaluation, the project cost would have been increased significantly.

In addition to considering these costs suggestive, the reader should also consider that each evaluation effort can be seen as the first phase of an on-going evaluation process. Should any of the agencies whose training we evaluated decide to continue the evaluation process, their costs would be less than ours since some functions of evaluation may not have to be iterated, such as negotiating, establishing objectives, developing an evaluation design or developing basic instrumentation.

Fundamental Conclusions

While this paper is primarily concerned with unresolved issues related to the evaluation of training, there are certain fundamental conclusions that can be drawn from the project. They are of sufficient importance that they are presented here:

1. Constructive evaluation of all types of training afforded Federal civilian employees is well within the present state of the art.

2. Evaluation, applied to carefully selected targets, can reduce costs and improve the results of training significantly.

3. Linking training with other problem-solving approaches can produce benefits exceeding those to be gained by methods solely concerned with improving the effectiveness of training.

In all six demonstrations we were able to draw reasonable, if sometimes guarded, conclusions about the effectiveness of training. We also discovered many impediments to drawing more unequivocal, far-reaching conclusions. However, in most cases, we were able to project ways that those impediments could be overcome, whether they involved selection of trainees, evaluation design or instrumentation for data-gathering. We therefore conclude that constructive evaluation, that which yields useful information to trainers and decision-makers, is clearly achievable.

We were able also to project specific ways in which proposed changes would either directly reduce costs of training, improve the quality of the training, or achieve a greater impact on the mission of the organization. Thus we conclude that evaluation can lead to improved economic efficiency by helping managers to reach their specific work objectives at relatively lower costs.

Perhaps most importantly, we found repeated evidence that training alone would not solve many performance problems. This finding strengthens our conviction that training must be conceptualized as one of a number of management tools for increasing the efficient use of labor as a factor of production. A decision to train should be reached after consideration of its potential for effecting change relative to the cost and potential of other tools (communications, job redesign, job aides, incentive sytems, and performance feedback, to mention a few).

ISSUES AND RECOMMENDATIONS

The project served to sharpen the focus on several issues which require the attention of OMB and OPM management. These issues are addressed below. Each is briefly discussed in terms of its general nature and in most cases is exemplified by a case in point. Potential solutions of the issue are described along with necessary conditions for those solutions to be effective.

Finally, recommendations for OMB and OPM actions are given.

Issue 1: A pervasive lack of planning and analysis before starting to train characterizes the approach to training in many organizations.

Discussion:

a. Training is often undertaken as the sole solution to a perceived problem when lack of skill or knowledge on the part of employees is only a portion of the problem.

In these and other evaluations conducted by the training leadership staff, we have discovered situations where training was initiated as the only solution to a problem when, if training were 100% effective, only a fraction of the problem would be solved. An example of this was found in the travel regulations training we evaluated for this report. We discovered that although the training was planned and conducted in a highly competent manner, it could not solve performance problems which revolved around lack of incentives for satisfactory performance and the infrequency with which many secretaries prepare vouchers. We concluded that job aides would ameliorate performance as long as regular clerical personnel were preparing vouchers. We also concluded that shifting voucher preparation to the central finance office's travel section would be a potentially cost-effective solution.

In contrast, we found during our evaluation of a managerial communications course that an extraordinarily competent contractor performed an analysis of decision-making and communications in the contracting organization before designing the course. As a result the course appears to have met very real organizational needs.

b. Much training resists effective evaluation because of a failure to state the purposes and intended outcomes of training in ways specific enough to assess with confidence.

In evaluating a course for scientists we found it difficult to assess the practical effectiveness of different aspects of the training because specific behavioral objectives had not been defined for the many lectures and lab sessions which constituted the course. Had objectives been clearly defined, we could have drawn more conclusive inferences regarding the relative value each segment of training held for its participants, relying more upon performance than self-reporting.

c. Evaluation is usually a one-time terminal event rather than a continuous process that monitors the effectiveness of training.

In evaluating an executive development program, we were not able to begin until the program was completed. As a result we were not able to arrange for certain critical experimental controls that could have allowed us far more confidence in generalizing from our findings. We were also limited by the data which had been collected prior to our evaluation. Although we collaborated in the design of comprehensive post-program instrumentation, it could not entirely compensate for the insufficiency of the pre-program information.

In addition to pre-training information and data which is collected during training, follow-up data is often an essential component of effective evaluation. This component requires strong management support since it typically involves a study of training impact of participant performance back on the job. Yet, without such information, the ultimate effect of training on job performance and organizational productivity is difficult or impossible to assess.

d. Individual differences in the needs of various personnel for specific training have often been ignored, resulting in some individuals failing to get the training they need and others receiving training they do not need.

In evaluating a technical/scientific course for radionuclide material users, we discovered through pretesting that several members of the class may have been able to pass the final exam without taking the course. As a result of similar past experiences, trainers have sometimes attempted to screen trainees before training begins. However, these efforts have been largely countered by the view that prospective trainees shouldn't be expected to give up work time in advance of training to respond to tests, assignments or interviews.

Management needs to encourage efforts to diagnose learner needs before training so that pretesting has some priority in the work setting. At the same time, trainers must have ready access to methods for diagnosing trainee needs so that they possess sufficient test and measurement methods to construct efficient means for diagnosing needs.

In order to assure that training is undertaken only after an analysis of performance problems, that it be carefully planned to meet clear performance objectives, that it include continuous evaluation, and that it be given to those and only those who need it, a consolidation within agencies of training and other staff activities directed toward improving employee effectiveness and productivity is warranted.

Such a coordination or consolidation of activities implies as a minimum that some program analysts should have a basic knowledge of training principles. It also implies that analysts may need to work directly with trainers in assessing performance and recommending solutions to performance problems. The establishment of the Workforce Effectiveness and Development Group within the OPM serves as a model for such restructuring. As the WED group gains experience, we will be able to provide continuing guidance to consolidation efforts through research, consultation and the publication of models and illustrative standards.

Recommendations:

OMB and OPM, in all dealings with agencies, should reinforce the practice of applying evaluation to all aspects of employee development, not just the actual classroom experience.

OMB and OPM should encourage coordination within agencies of training and other staff activities directed toward improving employee effectiveness and productivity.

OPM should provide guidance and consultation concerning minimum essential training evaluation activities for operational settings.

OPM should encourage agencies to use systematic program development processes for meeting new training needs.

Issue 2: Many trainers lack either time, skill or incentives for conducting effective evaluation.

Discussion:

These are closely related problems. Evaluation is a specialization within a demanding profession. While it is true that a competent professional trainer should be well versed in the basics of evaluation, it is unrealistic to expect most trainers to be able to apply evaluative devices of the complexity or level of sophistication characterizing some of those employed in the demonstration project.

In none of our evaluations did the host agency have the resources for performing the scope of assessment undertaken by the OPM evaluators.

While most of these agencies have several training personnel, in many organizations the small one or two person training shop barely able to keep ahead of the paper work is the norm rather than the exception. Individuals in these shops, even when capable of performing evaluation, would require a clear signal of changed priorities before they could be expected to undertake even sporadic evaluations. As it is, many government trainers have no relevant academic preparation for the profession. Short of requiring a degree in a relevant subject for entry or advancement in the training profession, we can at least encourage better prepared people to enter the field, particularly those with preparation in evaluation.

Moreover, agencies may find it productive to analyze the tasks performed by trainers to see if a more efficient use can be made of their time and talents. Typically, professional-level trainers perform time-consuming administative paper-work which may be accomplished by clerical personnel. The use of clerical personnel (or as appropriate, paraprofessionals) for these tasks would have the effect of allowing trainers to devote more attention to more appropriate activities such as assessment, analysis and evaluation.

Recommendations:

<u>OPM should increase its active cooperation with colleges and universities in the development of programs which train specialists in evaluation for training and human performance</u>.

OPM should encourage the inclusion of employee development, evaluation and needs analysis as important areas of management concern and appropriate subjects of performance standards and appraisal for trainers.

Issue 3: Much contracted training is not carefully monitored for effectiveness.

Discussion:

In evaluating a contracted course for photocomposition machine operators, we found that the contractor was allowed to state his own minimal standards. Those standards did not specify criteria for measuring success on one of the three major learning objectives. As a result, degree of success was largely a matter of individual interpretation.

Agency training officers need to know enough to judge whether a contractor's evaluation methods are adequate. In light of the limited expertise of trainers, guidelines in the form of sample RFPs and sample training contracts may directly assist those responsible for purchasing training in assuring that the training will be evaluated on a clear set of criteria. A similar set of guides on testing for learning achievement may help the purchaser to estimate the quality and adequacy of the contractor's proposed instrumentation.

Recommendation:

OPM should coordinate with the Office of Federal Procurement Policy in gathering information necessary for establishing policy and guidelines for agencies regarding the evaluation of contracted training.

Issue 4: Training evaluation can be costly. It has to compete with other functions such as program administration and evaluation of other dimensions of performance; yet, little systematic cost data exists for the evaluation of training.

Discussion:

There has never been much cost-effectiveness data available in training. Such data presupposes among other conditions a very clear and detailed accounting of precisely what changes ensue in an organization's actual production, however it is measured. It also presupposes that the effects of training can be

separated from a multitude of other potential variables.

The training value models developed by the Training Leadership Division of OPM have been used increasingly over the last few years by a wide variety of agencies and other organizations. Their continued use and refinement should make them extremely useful in further cost-effectiveness studies. More evaluation demonstrations need to be conducted to provide a yet more representative body of examples, e.g., technical training courses for entry level personnel being prepared for complex jobs such as Claims Representative or Benefits Authorizer (such courses may currently run for as many as 20 consecutive weeks); needs analysis studies; follow-up evaluations; and comparative studies of programs in different agencies with similar objectives.

Recommendations:

OPM should provide guidance for deciding how to invest training evaluation resources.

OPM should encourage and cooperate with the Federal training community in performing training demonstrations in addition to those reported here.

Issue 5: There is a pervasive lack of information regarding what people have learned in training and how well they have been able to apply that learning on the job.

Discussion:

A common reason given by agency trainers either for not maintaining a record of what trainees have learned or for failing to conduct follow-up studies of training impact by reviewing performance with supervisors is that these activities may violate the Privacy Act. Moreover, experimental programs in entry-level training are avoided out of concern over selection guidelines. In any case, there is a general lack of systematized information on the relationship of training with job performance.

During our demonstration project, in evaluating the experimental course for photocomposition operators, we observed that agency personnel, despite their main interest in the course's potential for training new operators, chose to give it to a volunteer group of experienced operators. The agency personnel argued that placement decisions made from trainee performance in an experimental course could be subject to grievance. Similarly,

in evaluating the managerial course on communications, we were dissuaded from discussing specific trainee action plans with trainees' supervisors on the supposition that the Privacy Act would be violated.

It would appear that agency managers and the information officers they consult need to give clear guidance regarding what can and cannot be done in the name of training and employee development. Furthermore, these individuals themselves need guidance before they can set parameters regarding training information and the Privacy Act as well as the Uniform Guidelines on Employee Selection Procedures.

Within such parameters, the relationship between training and performance should be investigated more fully. Agencies should strive for a system of needs analysis and training prescription which begins with performance appraisal. Appraisals should be studied and used as the principal basis for training decisions. Following that, training should be designed to meet the specific job-related needs of the employee. Finally, training should be assessed in relation to the subsequent job performance of the employee as reflected in the ensuing performance appraisal.

Recommendation:

OPM should develop guidance for agencies to assist them to obtain group performance information without violating laws or other protections to employees.

OPM should encourage the use of performance appraisals as vehicles for measuring the need for training and the effects of training on performance.

Issue 6: Recommendations to evaluate training or human performance may be ignored by decision-makers in their efforts to give full attention to program implementation. Furthermore, recommendations coming from evaluations may be similarly ignored. Thus however competent the evaluation, it has no value if it is not used.

Discussion:

Many managers are unaware of the very substantial advances that have been made in the immediate past in the technology of evaluation, including techniques to project the costs and benefits of training. Consequently, they are either ignoring the evaluation process or they are accepting evaluation and projections much less rigorous than what the present state of

the art is capable of producing.

The literature on evaluation research documents the commonality of decision-makers disregarding the findings, conclusions and recommendations of evaluations. Often, this disregard stems from the decision-maker's perception that an evaluator misunderstood the problem, used methodology inappropriate to the task, or failed to properly consider organizational constraints and imperatives in making recommendations. In other instances, disregard for evaluation information appears to stem largely from a commitment to the status quo.

Recommendation:

OMB should require supportive analysis and justification for large scale investments in training (including trainee salaries) in the same way that justification is required for any other discrete expenditure.

APPENDIX

Executive Summaries from the Six Evaluation Demonstration Case Studies

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An Evaluation of the Executive Development Program of the Science and Education Administration, United States Department of Agriculture

Executive Summary

The Agriculture Research unit of U.S.D.A.'s Science and Education Administration (SEA) is charged with assuring the availability of an adequate supply of moderately priced agriculture commodities to the marketplace. Accomplishment of this mission is based, in part, on successful scientific research and effective management of the research function.

In order to prepare potential executives to manage this function, an executive development program was designed for SEA and implemented in June of 1977. That program became the object of the evaluation demonstration begun in September of 1978.

Three major objectives were defined for the evaluation by OPM and SEA staff:

EVALUATION OBJECTIVE 1
Determine the extent to which potential executives have developed professionally during the Executive Development Program.

EVALUATION OBJECTIVE 2
Determine the role of the mentor-understudy relationship in the development of the potential executives.

EVALUATION OBJECTIVE 3
Determine ways in which the Executive Development Program can be improved.

Several sources of data were employed in the evaluation. Data for Objective 1 were gathered from XD Program participants called Potential Executives (PEs) and senior managers who served as their mentors. Both groups were asked to write narrative reports on their experiences in the XD Program. In addition, PEs were asked to send in copies of Executive Work Assignments and mentors were asked to send in completed copies of "The Appraisal of Potential for Management" form. All of the above were collected in November, 1978. A second phase of data gathering related to the PEs' professional growth involved the group of PEs, a comparison group of runners-up to the program, and a selected group of incumbent executives. These individuals completed the "Appraisal of Executive Attributes" questionnaire. Their responses

were collected at the beginning of January, 1979. Program participants appeared to experience significantly more professional growth during the 18 month program than did their comparison group counterparts.

Data for Objective 2 were supplied in November, 1978, by PEs and mentors using a questionnaire on the mentor process. Regarding the second objective, while there were areas for improvement, participants and their mentors agreed that their relationships were useful and enhanced the effectiveness of the program.

Data for Objective 3 were gathered from PEs and mentors in November, 1978, in the form of narrative critiques of the XD Program. With respect to Objective 3, major suggestions for improving the program involved the creation of more "acting" positions outside the participants' immediate areas of work and a lengthening of the program.

As a result of the findings, the evaluation team recommended that the Executive Development Program be continued. In addition, it recommended that the mentor-understudy relationship be continued with modifications which would ensure appropriate matching of potential executives and mentors and which would encourage continued improvement of this aspect of the program. The evaluation team also recommended that an ongoing management system for the program be designed and implemented as a means of ensuring that the substance of the program remains appropriate to the needs of participants and the agency.

An Evaluation of a Scientific/Technical Course on Radiological Health and Safety Presented by the National Institutes of Health

Executive Summary

Research efforts at the National Institutes of Health (NIH) include the use of radioactive material both in laboratory work and in the treatment of patients. As part of the Nuclear Regulatory Commission requirements, organizations such as NIH which are licensed to use radionuclides must take a number of safety precautions. For instance, in order for NIH personnel to be authorized to order radioactive material, they must demonstrate that they have appropriate experience with and knowledge of its use. One means of meeting the knowledge requirement is to successfully complete a nine-day course offered by NIH, entitled "Radiological Health for Radionuclide Users."

The course is conducted by NIH's Radiation Safety Branch (RSB), which has a variety of radiation safety responsibilities. Sixty people attend each session of the course, which is offered twice a year. The course faculty includes NIH personnel and guest lecturers. The goals of the course are to: 1) enable NIH staff to become authorized users of radioactive materials; 2) give participants a working knowledge of radiological health so that they can evaluate hazards on the job; 3) instruct participants in specific tools and techniques for carrying out research efforts which involve radioactive material; and 4) provide information about the staff, services, and sources of assistance in the Radiation Safety Branch.

Course evaluations in the past had consisted of obtaining participants' opinions at the end of the course. For this evaluation effort, a variety of data was sought which could be used to further judge course effectiveness and make changes in the course if appropriate. The evaluation objectives were to:

1. Determine the adequacy and congruence of the course process (sequence, instructional strategies, etc.).
2. Determine participants' perceived value of the course.
3. Determine participants' degree of learning.
4. Determine perceived change in behavior as a result of the course.
5. Determine the costs of the course.

Measures were taken during one course session, as well as six months after the completion of an earlier comparable course session. The evaluation of the course indicated that all four course goals were

met. Morevover, 80 percent of the participants said that they would recommend the course to others even if it were not required to become an authorized user.

The evaluators noted, however, that portions of the course may not be necessary for certain participants. One reason for this state of affairs is that a single course addresses two audiences with different sets of needs--the Ph.D. laboratory researchers, and the M.D. clinicians. The first group uses radioactive material as part of its experiments, and exposure is certainly unplanned and undesired. The second group, the M.D.s, while needing to protect themselves from exposure, deliberately introduce a defined amount of radioactive material into humans. While both groups may need a common core of information in the Radiological Health course, they also have distinct knowledge requirements.

Suggestions were presented to NIH for making the course more efficient. The possible changes to the course include:
1) dropping, shortening, and/or combining certain lectures;
2) providing core information, then having two independent tracks, one for laboratory researchers and one for clinicians;
3) providing two different courses for the two primary audiences;
4) designing the course in modules to meet individual needs.

Finally, it was suggested that instead of, or in addition to, providing instruction during the nine-day course on specific research techniques involving the use of radionuclides, separate short courses on those techniques might prove worthwhile.

An Evaluation of a Technical Course on Electronic Photocomposition Keyboard Techniques Presented at the Government Printing Office

Executive Summary

The Electronic Photocomposition Division (EPD) of the Government Printing Office will be assimilating large numbers of entry-level keyboard operators in the near future. At the same time, as older typesetting processes are being phased out, the workload demands on EPD are growing. A concern for this situation led EPD to look for new ways to train both entry-level and journeyman-level operators in keying techniques. The Malt Audio-Visual Instructional System (MAVIS) was viewed at a trade show and subsequently contracted for a pilot program to train 12 journeyman-level operators. Three major objectives were established for the training by the contractor:

1. Increase typing speed from 15 percent to 40 percent on an average across the group.

2. Decrease errors 50 percent on an average across the group.

3. Decrease the fatigue that comes from typing all day.

In light of these training objectives, the OPM evaluation team set three evaluation objectives:

1. To measure whether the training accomplished its objectives.

2. To measure the economic impact of the training.

3. To recommend improvement for the training process.

The evaluation design used was a modified pre-control and post-control group design. Pre-training and post-training production and accuracy measures were taken, trainee and control group behavior was observed, and trainee perceptions were solicited. This design yielded information showing that only the training objective on fatigue was successfully met but that the training did seem to produce tangible benefits to the organization. Several recommendations were made concerning the improvement of the training and the evaluation.

This effort demonstrates the feasibility and practicality of evaluating the effectiveness of technical training as well as some of the difficulties which are inherent in trying to use an experimental design in an operational setting.

An Evaluation of an Interagency Course on
Training Evaluation Presented by the Office
of Personnel Management

Executive Summary

Through a training needs survey, the Personnel Management Training Center of the U. S. Office of Personnel Management identified a training need shared by many Employee Development Specialists in the area of training evaluation. To meet this need, a course based on the publication A Process for the Evaluation of Training was developed and conducted. That course, "Evaluation of Training Courses," was selected to be the subject of this demonstration project.

The instructor's primary course objective was to transfer evaluation technology as exemplified in the Process to agency trainers. The evaluation instruments used were designed to elicit information which would help make the course more responsive to agency needs consistent with this objective. The following evaluation objectives were formulated during preparation of an evaluation plan by the instructor:

1. Determine whether participants are able to meet course objectives, and, if not, why not,

2. Ascertain participants' reaction to content appropriateness, presentation effectiveness, written materials effectiveness, personal accomplishment of objectives, and instructor effectiveness,

3. Determine whether skills and/or knowledges acquired during training are used back on the job, and, if not, why not.

A review of the major findings in relation to these evaluation objectives disclosed the fact that most participants were able to meet course objectives, indicating that considerable learning took place. Participants rated the course favorably. However, participants appeared to experience difficulty in applying knowledge of evaluation design and data analysis as taught in the course. They cited primary obstacles as their own lack of time for performing evaluation and lack of management support for evaluation activities. This latter constraint is seen as an indication that managers do not yet perceive training evaluation as a useful tool in performance improvement and human development.

An Evaluation of a Clerical Course on Travel Regulations Presented by the National Aeronautics and Space Administration

Executive Summary

Personnel at the Financial Management Office (BFH), the NASA Headquarters office which is responsible for processing travel forms and certifying travel vouchers for payment, detected a performance problem. They noted that many travel forms were submitted incorrectly to BFH and that some NASA secretaries called BFH regularly for information about basic travel regulations, slowing down the BFH work process.

BFH staff therefore requested NASA's Headquarters training office to develop and offer a course for NASA secretaries on the regulations and policies governing reimbursement for domestic travel. Such a course was developed and given twice, once in May, 1978, and again in November, 1978. The second session of the course was evaluated by OPM personnel working in conjunction with the course instructor.

The objectives of the evaluation were designed to address both the internal integrity of the training and its organizational impact. These evaluation objectives were:

1. Assess trainee classroom performance on the course objectives.

2. Assess the congruence of the course process with the course objectives.

3. Estimate the value of training to the organization.

4. Identify factors related to performance which are not affected by the course.

Data was gathered through an examination of work samples, pretests and posttests, observations, interviews, and questionnaires. Some of the data used in determining the value of training were estimates; therefore the cost-effectiveness figures are approximate rather than precise.

The evaluation team found that trainees by and large met the course objectives and that the overall course process was congruent with the objectives. However, although the training was effective in transmitting learning, it did not appear to be cost-effective to the organization. The dollar value of the time lost through the performance deficiency seems to be less than the cost of training to eliminate the deficiency. Furthermore, examination

of other performance-related variables revealed that other solutions to the performance problem might be more cost-effective than formal classroom training. Recommendations were that NASA consider 1) non-classroom methods of acquiring skills and knowledges, and 2) alternative ways of organizing the work flow associated with travel forms.

An Evaluation of An Organizational Development
and Training Effort in Management Communications
Conduct at Fort Belvoir

Executive Summary

When two organizational components depend upon one another for information they require to accomplish their missions, they share a need for communication which is timely, clear, and adequate. Such interdependence is characteristic of two directorates at the Fort Belvoir Engineering Center, Department of the Army.

The Fort Belvoir Post Commander and his staff perceived communication between these two directorates as disruptive of mission accomplishment rather than facilitative. Command concern led to a contract for a "managerial communications" course for directorate managers. That course became the subject of the evaluation discussed here.

The course was explicitly designed to help managers communicate management needs and management information to one another, to subordinates and to superiors, both within their own directorates and across directorates. In light of the purpose of training, three major objectives were formulated for the evaluation:

1. To assess on-the-job changes in participant behavior which resulted from the training.

2. To assess the effect of the training on the two directorates.

3. To identify problems encountered when participants attempted behavior changes and problems or concerns of individuals who were directly or indirectly affected by the participants' behavior changes.

An evaluation technique which focuses on goal-setting and behavior change was used to collect most of the data (the Participant Action Plan Approach). It yielded a clear picture of improved communications practices among course participants as well as resolutions of work problems within and across directorates. Furthermore, no new problems were perceived to have resulted from actions the participants initiated on-the-job to improve communications.

Thus, the course was confirmed as an effective means for initiating the improvement of interdirectorate communications. Furthermore, the evaluators recommended that the course be followed by organizational development efforts at other levels of organization within the Command, to include other course sessions for managers who could not

attend the first session. In addition, the evaluators recommended that "action planning" (participants setting performance objectives for themselves) be employed as a major means of inducing improvement in communications behavior.

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Six teams performed the evaluation demonstrations and the seventh provided the synthesis of evaluation results with a policy study which enabled us to generate the statement of issues and recommendations set forth in the introductory section of the report.

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